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10/575,344	03/20/2007	Kotaro Kobayashi	MI/242	2194

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EXAMINER	
SINCLAIR, DAVID M	
ART UNIT	PAPER NUMBER
2831	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,344	KOBAYASHI ET AL.	
	Examiner	Art Unit	
	DAVID M. SINCLAIR	2831	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 April 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/07/2006, 06/01/2006, & 10/10/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. Figure 7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities: typographical errors.

Page 14 – line 28 "The average particle diameter" is believed to be "The average pore diameter"

Appropriate correction is required.

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is

requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

5. Claim 8 is objected to because of the following informalities: typographical errors – "the average particle diameter" is believed to be "the average pore diameter". Appropriate correction is required.

For the purpose of examination, the examiner is taking the claim to be "the average pore diameter".

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1, 3-4, 6-7, 9-10, 12-13, 15-16, and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Machine translation of JP 11-162787 hereafter

referred to as Kazuya in view of Machine translation of JP 2001-307966 hereafter referred to as Takeshi.

In regards to claims 1 & 12,

Kazuya teaches an electric double layer capacitor comprising an electrode for an electric double layer capacitor comprising a polarizable porous sheet comprising conductive materials including a carbonaceous electric double layer forming material, a carbon material for ensuring conductivity, and a binder ([0028] – electrode made would be polarizable and porous) integrated via a conductive intermediate layer on at least one surface of a current collector ([0050]); the conductive intermediate layer contains synthetic rubber and a carbon material ([0033]-[0034]).

Kazuya fails to teach the conductive intermediate layer contains two or more carbon materials having different diameters.

Takeshi teaches a conductive intermediate layer contains two or more carbon materials having different diameters ([0034]; it is known in the art that carbon black (small diameter) and graphite (large diameter) have different diameters).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use two carbon materials in the conductive adhesive as disclosed by Takeshi with the conductive adhesive of Kazuya to obtain a

conductive adhesive, and thus an electrode for an electric double layer capacitor, that is uniform and excellent in conductivity.

In regards to claim 3,

The references as applied above teach all the limitations of claim 3 except a material containing carbon black is the carbon material of the conductive intermediate layer. However, Kazuya further teaches a material containing carbon black is the carbon material of the conductive intermediate layer ([0033]).

In regards to claim 4,

The references as applied above teach all the limitation of claim 4 except the synthetic rubber of the conductive intermediate layer is styrene-butadiene rubber. However, Kazuya further teaches a synthetic rubber of a conductive intermediate layer is styrene-butadiene rubber ([0034]).

In regards to claim 6,

The references as applied above teach all the limitations of claim 6 except the conductive intermediate layer is formed using a conductive adhesive containing the carbon material, the synthetic rubber, and a dispersion medium; and the entire amount of carbon material is 3 to 30 mass % in the conductive adhesive. However, Kazuya further teaches the conductive intermediate layer is formed using a conductive adhesive containing the carbon material, the synthetic rubber,

and a dispersion medium; and the entire amount of carbon material is 3 to 30 mass % in the conductive adhesive ([0049]).

In regards to claim 7,

The references as applied above teach all the limitation of claim 7 except the synthetic rubber is 7 mass % or less in the conductive adhesive. However, Kazuya further teaches the binder (synthetic rubber) is 7 mass % or less in the conductive adhesive ([0049]).

In regards to claim 9,

The references as applied above teach all the limitations of claim 9 except the collector is composed of aluminum. However, Kazuya further teaches the collector is composed of aluminum ([0012]).

In regards to claim 10,

The references as applied above teach all the limitations of claim 10 except the collector has been subjected to a surface roughening treatment. However, Kazuya further teaches the collector has been subjected to a surface roughening treatment ([0023]).

In regards to claim 13,

Kazuya teaches a conductive adhesive for forming a conductive intermediate layer ([0050]) used in an electrode for electric double layer capacitors ([0001]) obtained by integrating a polarizable porous sheet, which comprises constituent materials including a carbonaceous electric double layer forming material, a carbon material for ensuring conductivity, and a binder ([0028] – electrode made would be polarizable and porous), onto at least one surface of a collector via the conductive intermediate layer ([0050]); with the conductive adhesive being characterized by containing a carbon material, a synthetic rubber, and a dispersion medium ([0033]-[0034] & [0049]).

Kazuya fails to teach the conductive adhesive contains two or more carbon materials having different diameters.

Takeshi teaches a conductive adhesive contains two or more carbon materials having different diameters ([0034]; it is known in the art that carbon black (small diameter) and graphite (large diameter) have different diameters).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use two carbon materials in the conductive adhesive as disclosed by Takeshi with the conductive adhesive of Kazuya to obtain a conductive adhesive, and thus an electrode for an electric double layer capacitor, that is uniform and excellent in conductivity.

In regards to claim 15,

The references as applied above teach all the limitations of claim 15 except a material containing carbon black is the carbon material of the conductive intermediate layer. However, Kazuya further teaches a material containing carbon black is the carbon material of the conductive intermediate layer ([0033]).

In regards to claim 16,

The references as applied above teach all the limitation of claim 16 except the synthetic rubber of the conductive intermediate layer is styrene-butadiene rubber. However, Kazuya further teaches a synthetic rubber of a conductive intermediate layer is styrene-butadiene rubber ([0034]).

In regards to claim 18,

The references as applied above teach all the limitations of claim 18 except the total of the carbon material in the conductive adhesive is 3 to 30 mass % However, Kazuya further teaches the total of the carbon material in the conductive adhesive is 3 to 30 mass % ([0049]).

In regards to claim 19,

The references as applied above teach all the limitation of claim 19 except the synthetic rubber is 7 mass % or less in the conductive adhesive. However,

Kazuya further teaches the binder (synthetic rubber) is 7 mass % or less in the conductive adhesive ([0049]).

9. Claims 2, 11, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuya and Takeshi as applied to claims 1 and 13 above, and further in view of Mushiake et al. (6,359,769).

In regards to claim 2 & 14,

The references as applied above teach all the limitations of claim 2/14 except a material containing platelet-like graphite is the carbon material of the conductive intermediate layer.

Mushiake '769 teaches a material containing platelet-like graphite in a carbon material of a conductive intermediate layer (Table 1 – example 7; teaches natural graphite which is a platelet-like graphite).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use natural graphite in a conductive adhesive as disclosed by Mushiake '769 with the conductive adhesive disclosed by the combination of Kazuya and Takeshi to obtain a conductive adhesive in which the unevenness caused by non-uniform dispersion of carbon black is improved.

In regards to claim 11,

Kazuya teaches a conductive adhesive containing a carbon material and a dispersion medium ([0049])) being applied to a current collector and/or a polarizable porous sheet ([0038]) comprising constituent materials including a carbonaceous electric double layer forming material, a carbon materiel for ensuring conductivity, and an adhesive ([0028] – electrode made would be polarizable and porous).

Kazuya fails to teach the conductive adhesive containing two or more carbon materials with different diameters and before the dispersion medium dries, the collector and polarizable porous sheet are glued together and compressed, thereby causing part of the nonvolatile part of the conductive adhesive to be pressed into the holes of the polarizable porous sheet.

Takeshi teaches a conductive adhesive containing two or more carbon materials having different diameters ([0034]; it is known in the art that carbon black (small diameter) and graphite (large diameter) have different diameters). Takeshi fails to teach before the dispersion medium dries; the collector and polarizable porous sheet are glued together and compressed, thereby causing part of the nonvolatile part of the conductive adhesive to be pressed into the holes of the polarizable porous sheet.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use two carbon materials in the conductive adhesive as disclosed by Takeshi with the conductive adhesive of Kazuya to obtain a conductive adhesive, and thus an electrode for an electric double layer capacitor, that is uniform and excellent in conductivity.

Mushiake '769 teaches before the dispersion medium dries, the collector and polarizable porous sheet are glued together and compressed, thereby causing part of the nonvolatile part of the conductive adhesive to be pressed into the holes of the polarizable porous sheet (column 6 – lines 23-33 and column 7 – lines 35-44 & 51-52).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the compression and gluing step disclosed by Mushiake '769 with the combination of Kazuya and Takeshi to produce a reliable adhesion at the lamination interface as taught by Mushiake '769 (column 6 – line 29-30).

10. Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuya and Takeshi as applied to claims 4 and 16 above, and further in view of Dow Reichhold Specialty Latex.

In regards to claim 5/17,

The references as applied above teach all the limitations of claim 5/17 except the styrene-butadiene rubber has a glass transition temperature of -5 to 30 °C.

Dow Reichhold Specialty Latex teaches the styrene-butadiene rubber has a glass transition temperature of -5 to 30 °C (DL 233, DL238, DL240, DL 374, DL 395, DL 396).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the styrene-butadiene rubbers disclosed by Dow Reichhold Specialty Latex as the conductive adhesive binder of the combination of Kazuya and Takeshi to obtain a conductive adhesive in which the adhesive component exhibits good stability and chemical compatibility.

11. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kazuya and Takeshi as applied to claim 1 above, and further in view of Mushiake '769 and Inagawa (6,021,039).

The references as applied above teach all the limitations of claim 8 except the polarizable porous sheet has an average particle diameter of 0.1 to 5 μm and a porosity of 40 to 90%.

Mushiake '769 teaches a polarizable porous sheet having a porosity of 40 to 90% (column 4 – lines 3-4). Mushiake '769 fails to teach the polarizable porous sheet has an average particle diameter of 0.1 to 5 μm.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the polarizable porous sheet porosity disclosed by Mushiake '769 as the porosity of the polarizable porous sheet disclosed by the combination of Kazuya and Takeshi to obtain an electrode with a porosity that allows the conductive adhesive to penetrate into the porous sheet but prevents the conductive adhesive from penetrating to deep into the porous sheet as taught by Mushiake '769 (column 4 – lines 5-14).

Inagawa '039 teaches a porous sheet (electrode) having an average particle diameter of 0.1 to 5 μm (column 8 – lines 57-61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the average pore size disclosed by Inagawa '039 as the average pore size of the combination of Kazuya, Takeshi, and Mushiake '769 to obtain a polarizable porous sheet (electrode) which allows the conductive carbon of the conductive adhesive to penetrate the porous sheet and prevents the conductive carbon of the conductive adhesive from penetrating to deep into the porous sheet as taught by Mushiake '769 (column 4 – lines 15-25).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Murata et al. (5,766,753) teaches an adhesive layer containing carbon black and flake-like graphite as conductive fillers (column 1 – summary of invention).

Ito (6,475,670) teaches a porous electrode comprising active carbon, graphite, and a rubber type binder (abstract).

Morimoto et al. (4,862,328) teaches a porous polarizable electrode comprising activated carbon, carbon black, and a binder (column 3). Morimoto '328 further teaches a porosity of 40-90% and a maximum pore size of 0.1 to 5 μm (Table 1).

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID M. SINCLAIR whose telephone number is (571)270-5068. The examiner can normally be reached on Mon - Thurs 6:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. Gutierrez can be reached on (571) 272-2245. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Diego Gutierrez/
Supervisory Patent Examiner, Art Unit 2831

/D. M. S./
Examiner, Art Unit 2831